

REMARKS

I. Formalities

Applicants thank the Examiner for acknowledging Applicants' claim to foreign priority and receipt of the certified copy of the priority document. In addition, Applicants thank the Examiner for indicating acceptance of the drawings filed on March 9, 2006. Applicants also thank the Examiner for considering most of the references listed on the PTO/SB/08 Form submitted with the Information Disclosure Statement (IDS) of February 12, 2007.

II. Status of the Application

By the present Amendment, Applicant is amending claims 32, 36, 38, 45, and 47. Further, Applicant is adding new claims 53-57 to recite features of the invention as disclosed in the specification. No new matter is added. In addition, Applicant is canceling claims 37 and 46 without prejudice or disclaimer.

Accordingly, claims 32-36, 38-45, and 47-57 are all the claims currently pending in the application. Claims 32-38 and 43-52 have been rejected. Claims 39-42 would be allowable if rewritten in independent form. The present Amendment addresses each point of rejection raised by the Examiner. Favorable reconsideration is respectfully requested.

III. Claim Rejections Under 35 U.S.C. § 112, Second Paragraph

Claims 36-38 and 45 stand rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite, because the Examiner maintains that these claims use vague and nondescript terms. Applicants are amending claim 36 to recite that "the first lens surfaces and the second lens surface of the double aspheric lens are shaped such that they can be tested with the same test optics." Further, Applicants are cancelling claim 37 without prejudice or disclaimer, and amending claim 38 to recite that "the double aspheric lens is arranged in the

vicinity of a field plane of the imaging system such that the principal ray height is greater than the marginal ray height of the imaging system at the double aspheric lens.” Applicants respectfully submit that claims 36 and 38 appropriately define the metes and bounds of the claimed invention. For example, although claim 38 recites that the double aspheric lens is arranged “in the vicinity of” a field plane of the imaging system, the location of the double aspheric lens is further defined by the recital that the principal ray height is greater than the marginal ray height. In addition, Applicants are amending claim 45 to delete the recitation that the first aspheric lens surface and the second aspheric lens surface are deformed similarly. Accordingly, Applicants respectfully request that the Examiner withdraw the rejection of claims 36, 38, and 45 under 35 U.S.C. § 112, second paragraph.

IV. Claim Rejections Under 35 U.S.C. § 102(b)

Claims 32-36 and 43-52 stand rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 6,646,718 to Schuster et al. (hereinafter “Schuster”). Applicants respectfully traverse this ground of rejection.

Independent Claim 32

Independent claim 32 recites an illumination system for a microlithography projection system in which at least one of the lenses within an optical imaging system of the illumination system is “a double aspheric lens in which each of the first lens surface and the second lens surface is an aspheric surface” (emphasis added). Applicants respectfully submit that Schuster fails to teach or suggest any double aspheric lenses as recited in claim 32. As defined in claim 32, a double aspheric lens is a lens in which both lens surfaces are aspheric surfaces.

In rejecting claim 32, the Examiner maintains that lens L425 in Fig. 5 is a double aspheric lens. Applicants respectfully disagree. Instead, Applicants submit that the lens L425

has only one aspheric surface, namely the concave entry surface denoted as AS4. As shown in Fig. 5, the mutually adjacent lens surfaces of the lenses L424 and L425 (denoted by AS3 and AS4)¹ are aspheric (col. 8, lines 29-31). This allows for excellent aplanar correction for the highest numerical aperture (col. 8, lines 31-33). The aspheric constants of these lens surfaces are correctly listed in the second portion of Table 4 of Schuster (each lens L424 and L425 only has one set of aspheric constants).

Applicants note that the first portion of Table 4 of Schuster appears to show that both surfaces of the lens L425 are aspheric, because they are both labelled as “AS.” However, the labelling of the lenses in the first column of Table 4 does not match the lens data in the second through sixth columns of Table 4. This is because an extra entry was inserted above the entry for L424, causing the lens data for each lens surface to shift downward by one lens surface. Specifically, the aperture stop position is treated in Table 4 as an additional plane (with an infinite radius) in the optical system. This line is labelled as “L422” in Table 4, but is obviously not a lens surface. Applicants submit that this is an obvious error that would have been immediately evident to those skilled in the art. Accordingly, the second lens surface (AS3) of lens L424 and the first lens surface (AS4) of lens L425 are aspherical, while the first lens surface of lens L424 and the second lens surface of lens L425 are spherical. None of the lenses disclosed in Schuster are double aspheric lenses, as recited in claim 32.

Further, claim 32 recites an illumination system for a microlithography projection system. In contrast, Schuster is directed to a projection objective for a microlithography projection system (col. 2, lines 19-29; col. 7, lines 42-44). As a person of ordinary skill in the art

¹ Lenses L424 and L425 are misdescribed as lenses L423 and L424 at col. 8, lines 29-31 of Schuster.

understands, a microlithography projection system includes an illumination system and a projection objective, wherein the illumination system illuminates a mask arranged in the exit plane of the illumination system, and the projection objective images the pattern of the mask onto an object arranged in the image plane of the projection objective ([0002] and [0040]). Schuster discloses only a projection objective, and is unrelated to an illumination system, as recited in claim 32.

Applicants submit that claim 32 distinguishes over Schuster at least by virtue of the aforementioned differences, as well as its additionally recited features. Further, claims 33-36, 38, 43, and 44 distinguish over Schuster at least by virtue of their dependencies on claim 32, as well as their additionally recited features.

With further regard to claim 35, Applicants submit that Schuster fails to teach or suggest that “the first lens surface and the second lens surface of the double aspheric lens are shaped such that they can substantially be transformed into one another by means of an orthotomic projection.” In rejecting claim 35, the Examiner alleges that Table 4 of Schuster discloses the quoted claim feature. Applicants respectfully disagree. Table 4 of Schuster merely lists the lens data and aspherical coefficients for the lenses within the projection objective shown in Fig. 5, and is silent with regard to whether any two aspheric lens surfaces could be transformed into each other by means of an orthotomic projection.

Independent Claim 45

Applicants are amending independent claim 45 to include the features of claim 46, and canceling claim 46. Specifically, claim 45 recites an optical imaging system for a microlithography projection exposure system in which the optical imaging system comprises a plurality of lenses including a first aspheric lens surface and at least one second aspheric lens

surface, wherein “the first aspheric lens surface and the second aspheric lens surface have substantially the same surface description with reference to curvature and aspheric constants.”

In rejecting claim 46, the Examiner maintains that Table 4 of Schuster discloses the quoted claim feature. Applicants respectfully disagree. As shown in the first portion of Table 4, none of the aspheric lens surfaces have substantially the same radius of curvature. Further, as shown in the second portion of Table 4, none of the aspheric lens surfaces have substantially the same aspheric constants.

Applicants submit that claim 45 distinguishes over Schuster at least by virtue of the aforementioned differences, as well as its additionally recited features. Further, claims 48-52 distinguish over Schuster at least by virtue of their dependencies on claim 45, as well as their additionally recited features.

Independent Claim 47

Applicants are rewriting claim 47 in independent form. Claim 47 recites an optical imaging system for a microlithography projection exposure system in which the optical imaging system comprises a plurality of lenses including a first aspheric lens surface and at least one second aspheric lens surface, wherein “the first aspheric lens surface and the aspheric second lens surface are shaped such that they can substantially be transformed into one another by means of an orthotomic projection.” As discussed above, Table 4 of Schuster merely lists the lens data and aspherical coefficients for the lenses within the projection objective shown in Fig. 5, and is silent with regard to whether any two aspheric lens surfaces could be transformed into each other by means of an orthotomic projection. Therefore, claim 47 distinguishes over Schuster at least by virtue of the aforementioned differences, as well as its additionally recited features.

V. Allowable Subject Matter

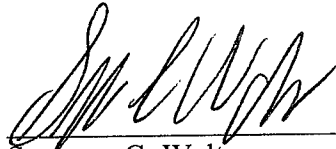
Applicants thank the Examiner for indicating that claims 39-42 would be allowable if rewritten in independent form. However, Applicants elect to hold the rewriting of these claims in abeyance at this time.

VI. Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,


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